WHAT IS CLAIMED IS:

1. A method of assisting a wiring design of a wiring structure comprising the steps of:

regarding the wiring structure constituted by a plurality of pieces of line streak members as an elastic body which has a circular section and in which a plurality of beam elements a linearity of which is maintained are coupled with each other;

applying information concerning a shape characteristic, a material characteristic and a constraining condition of the wiring structure as a predetermined condition to a finite element method;

calculating a predicted shape of the displaced wiring structure such that the predetermined condition is satisfied;

further calculating a characteristic value with respect to vibration for the calculated predicted shape; and

outputting the calculated predicted shape and the calculated characteristic value.

2. The method according to claim 1, wherein the characteristic value includes at least one of a natural frequency and a natural vibration mode.

3. The method according to claim 1, wherein

the wiring structure is a wire harness wired to a vehicle,

the constraining condition is defined by coordinates of

respective apexes of the plurality of beam elements and degrees of freedom at the respective apexes,

the shape characteristic is defined by a sectional area and a length of the beam element of the wiring structure, and

the material characteristic is defined by a moment of inertia, a polar moment of inertia, a density and a longitudinal modulus of elasticity and a transverse modulus of elasticity of the beam element.

4. A method of assisting a wiring design of a wiring structure by calculating a predicted shape concerning a wiring structure constituted by a plurality of pieces of line streak members, the method comprising the steps of:

analyzing a characteristic value with respect to vibration for the predicted shape; and

outputting a result of the analysis.

5. An apparatus of assisting a wiring design of a wiring structure in which the wiring structure constituted by a plurality of pieces of line streak members is regarded as an elastic body which has a circular section and in which a plurality of beam elements a linearity of which is maintained are coupled with each other, and a shape of the wiring structure which satisfies a predetermined condition is predicted by utilizing a finite element method, the apparatus comprising:

a setting unit for setting information concerning a shape characteristic, a material characteristic and a constraining condition of the wiring structure as the predetermined condition;

a predicted shape calculating unit for calculating a predicted shape of the displaced wiring structure such that the condition is satisfied by applying the predetermined condition to the finite element method;

a natural frequency calculating unit for calculating a natural frequency with respect to the predicted shape calculated by the predicted shape calculating unit; and

a first outputting unit for outputting the calculated predicted shape and the calculated natural frequency.

6. The apparatus according to claim 5 further comprising:

a natural vibration mode calculating unit for calculating a natural vibration mode with respect to the predicted shape calculated by the predicted shape calculating unit; and

a second outputting unit for outputting the calculated predicted shape and the calculated natural vibration mode.

7. An apparatus of assisting a wiring design of a wiring structure in which the wiring structure constituted by a plurality of pieces of line streak members is regarded as an elastic body which has a circular section and in which a plurality

of beam elements a linearity of which is maintained are coupled with each other, and a shape of the wiring structure which satisfies a predetermined condition is predicted by utilizing a finite element method, the apparatus comprising:

a setting unit for setting information concerning a shape characteristic, a material characteristic and a constraining condition of the wiring structure as the predetermined condition;

a predicted shape calculating unit for calculating a predicted shape of the displaced wiring structure such that the condition is satisfied by applying the predetermined condition to the finite element method;

a natural vibration mode calculating unit for calculating a natural vibration mode with respect to the predicted shape calculated by the predicted shape calculating unit; and

an outputting unit for outputting the calculated predicted shape and the calculated natural vibration mode.

8. A recording medium storing a program which causes a computer to function as an apparatus of assisting wiring design of a wiring structure in which the wiring structure constituted by a plurality of pieces of line streak members is regarded as an elastic body which has a circular section and in which a plurality of beam elements a linearity of which is maintained are coupled with each other, and a shape of the wiring structure

which satisfies a predetermined condition is predicted by utilizing a finite element method, the program causing the computer to functions as:

a setting unit for setting information concerning a shape characteristic, a material characteristic and a constraining condition of the wiring structure as the predetermined condition;

a predicted shape calculating unit for calculating a predicted shape of the displaced wiring structure such that the condition is satisfied by applying the predetermined condition to the finite element method;

a natural frequency calculating unit for calculating a natural frequency with respect to the predicted shape calculated by the predicted shape calculating unit; and

an outputting unit for outputting the calculated predicted shape and the calculated natural frequency.